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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 09/995,037
Filing Date: November 26, 2001
Appellant(s): THOMAS ET AL.

L. Lee Eubanks IV
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed March 9, 2009 appealing from the Office action mailed November 12, 2008.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

No amendment after final has been filed.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

6,727,483	THOMAS	4-2004
2,359,058	SOMES	12-1941

7,015,439	THOMAS	3-2006
3,403,240	HENDERSON	9-1968
5,430,274	COUFFET	7-1995
4,058,696	ANTIER	11-1977
5,198,053	DUNCAN	3-1993
5,874,713	CYDZIK	2-1999

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See In re Goodman, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); In re Longi, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); In re Van Ornum, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); In re Vogel, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, In re Thorington, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321© may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-6, 8, 47, and 51-55 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-30 of U.S. Patent No. 6727483. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claimed portable induction components

such as a power source and coupleable cooling unit are overlapped by portable induction components.

Claims 57-62, 64-87, and 91-94 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-30 of U.S. Patent No. 6727483 in view of USP 2359058 to Somes.

Claims 1-30 of USP 6727483 disclose an induction heating system comprising a power source and cooling unit except for flow switch. Somes teaches flow switch that deenergized (shut off) induction heating coil when said coil is not properly cooled (page 3, left-col. lines 40-57) in the same field of endeavor. Therefore, using flow switch in induction heating system to insure the induction coil is properly cooled is contemplated within ambit of ordinary skill artisan.

Claims 1-6, 8, 47, 51-55, 57-62, 64-87, and 91-94 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-28 of U.S. Patent No. 7015439. Although the conflicting claims are not identical, they are not patentably distinct from each other because the instant claimed portable induction components such as a power source, programmable controller (instant claims 1 and 47), and a temperature feedback device (instant claims 51-54) are overlapped by portable induction components (USP 7015439, claim 1, for example).

Claim Rejections - 35 USC § 103

The factual inquiries set forth in Graham v. John Deere Co., 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Appellant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-6, 8, 47, 51-55, 57-62, 64-87, and 91-94 are rejected under 35 U.S.C. § 103 as being unpatentable over USP 3403240 to Henderson in view of USP 5430274 to Couffet et al, USP 4058696 to Antier et al, and further teaching of USP 5198053 to Duncan.

The Henderson in figures 1-4 and col. 2, line 23 - col 4, line 33 discloses the features including the claimed portable induction unit with cooling. Cooling water is supplied to induction heating element (22) (col. 3, lines 65-71 and Figure 8 and paragraph bridging col. 2-3). Henderson discloses cooling water supply is controlled by a solenoid which is actuated by power supply motor-generator set. The solenoid (122), control box (131), and check valve (128) read on/function as the claimed “flow switch” (col. 3, lines 57-75). All have same function to control induction heating element temperature. Henderson does not disclose cooling fluid through the fluid-cooled induction heating cable, a portable power inverter, and programmable power source controller. Couffet discloses cooling tube in the induction conductor to prevent parasitic heating (col. 1, lines 14-59). Antier in col. 2, lines 5-44 discloses a portable power inverter which has benefit as set forth in col. 2, lines 5-11. Duncan in col. 7, lines 24-62

that using Lebtech Notebook Proportional-Integral-Derivative (PID) algorithm or any other control program with personal computer to control induction unit to produce time-temperature curve is commercially available. Programming power controlled unit is well known in the induction art for various heating. Therefore, it is contemplated within ambit of ordinary skill artisan to automate a manual control device of Henderson when technology is available to improve product quality. With respect to steps such pre-heating, post-heating, and stress relieve heating which can be done by induction heating system of Henderson. Moreover, it is well settled that a claim drawn to apparatus must distinguish over prior art in terms of structure. Ex parte Forsyth and Hancher, 151 USPQ 55, 55.

Recycle cooling fluid is contemplated within ambit of ordinary skill artisan especially for a portable induction system of Henderson when fresh cooling fluid is not immediately available.

Claims 57-62, 64-87, and 91-94 are further rejected under 35 U.S.C. 103(a) as being unpatentable over references as applied to claims above, and further in view of USP 2359058 to Somes.

The above references disclose the features substantially as claimed as set forth in the rejection above except for flow switch that detects coolant from induction heating coil. However, Somes teaches flow switch that deenergized (shut off) induction heating coil when said coil is not properly cooled (page 3, left-col. lines 40-57) in the same field of endeavor. Therefore, it would have been obvious to one having ordinary skill in the art of the cited references at the time the invention was made to provide flow switches that detect coolant and temperature of induction heating coil as taught by Somes in

order to provide proper cooling. In re Venner, 120 USPQ 193 (CCPA 1958), In re LaVerne, et al., 108 USPQ 335, and In re Aller, et al., 105 USPQ 233.

Claims 79-87 and 91-94 are rejected under 35 U.S.C. 103(a) as being unpatentable over references as applied to claims above, and further in view of USP 5874713 to Cydzik et al.

The above said references disclose the features substantially as claimed as set forth in the rejections above except for recycling a cooling fluid. However, Cydzik in paragraph bridging col. 6 and 7 teaches recirculating fluids for cooling a coil in the same field of endeavor or the analogous metallurgical art. Therefore, it would have been obvious to one having ordinary skill in the art of the cited references at the time the invention was made to recirculate cooling fluid like car radiator when fresh cooling fluid is not immediately available. In re Venner, 120 USPQ 193 (CCPA 1958), In re LaVerne, et al., 108 USPQ 335, and In re Aller, et al., 105 USPQ 233.

(10) Response to Argument

Response to Arguments

Appellant's arguments filed November 20, 2007 have been fully considered but they are not persuasive.

~~respectfully submit that~~ the Examiner's general suggestion that claims 1-30 of the '483 patent disclose a power source and a coupleable cooling unit does not render obvious the programmable power source controller or the single continuous cooling path of claim 1. "

Appellants argue that " and other claims in First Ground are noted. But, for one-way obviousness determination that a power source and coupleable cooling unit of USP '483 are encompassed by instant claim 1. Sample claims are pasted below:

Ground 1

Appealed claim

1. A portable induction heating system comprising in a portable unit:

a power source electrically couplable to a fluid cooled induction heating cable and operable to produce a varying magnetic field;

a programmable power source controller coupled to the power source for regulating the power conversion, and

a cooling unit fluidically couplable to the fluid-cooled induction heating cable for providing a cooling fluid through the fluid-cooled induction heating cable and around a workpiece to cool the fluid cooled induction heating cable, wherein the cooling unit is configured to cooperate with at least the fluid-cooled induction heating cable to provide a single continuous cooling path operable to dissipate heat from the fluid-cooled induction heating cable and from an electrical lead extending from the portable induction heating system to the fluid-cooled induction heating cable.

2. The system as recited in claim 1, comprising a flexible fluid-cooled induction heating cable.

3. The system as recited in claim 1, wherein the fluid cooled induction heating cable is coupled via connector assemblies to the power source and cooling unit.

ODP USP 6727483

12. An induction heating system, comprising:

a power source;

a cooling unit operable to remove heat from a cooling fluid,

a flexible induction heating cable, comprising:

an electrical conductor disposed within a hollow interior of the flexible induction heating cable to produce a magnetic field with electric current provided by the power source;

a first electrical connector electrically coupled to the electrical conductor, the first electrical connector being adapted for locking engagement with a second electrical connector electrically coupled to the power source; and

a first quick-disconnect fluid connector fluidicly coupled to the hollow interior of the flexible induction heating cable.

22. An induction heating system, comprising:
a power source;
a cooling unit operable to circulate cooling fluid through the induction heating system,
a flexible fluid-cooled induction heating cable, comprising:
an electrical conductor disposed within a hollow interior of the induction heating cable;
a first electrical connector electrically coupled to the electrical conductor; and
a first fluid connector fluidicly coupled to the hollow interior of the flexible fluid-cooled induction heating cable;
an extension cable operable to convey cooling fluid and conduct electricity to the fluid-cooled induction heating cable, the extension cable having a second fluid connector; and
a first fluid hose adapted to fluidicly couple the first fluid connector to the second fluid connector.

With respect to the “a single continuous cooling path” that there is no written description in the specification as originally filed to define the structure of “a single continuous cooling path”. In view of instant Figure 4, elements fluid control unit (74), cooling fluid (104), and output block (106) are merely read on circulate cooling fluid (see Figure 4 below).

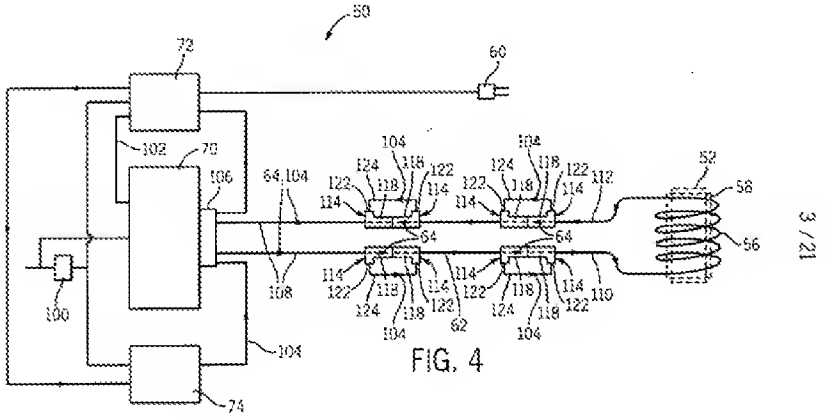


FIG. 4

Appellants in Second Ground argue

~~and the Somes reference. For instance, representative~~ claim 57 recites "a flow switch ... configured to detect the cooling fluid returning from the fluid-cooled induction heating cable and to effect discontinuation of the output power when the amount of the cooling fluid received from the fluid-cooled induction heating cable is below a threshold amount." Claim 57 also recites "a programmable controller operable to control induction heating." Appellants submit that these elements are not rendered obvious by claims 1-30 of the '483 patent or by the Somes reference.

" and other claims in Second Ground are noted. But, for one-way obviousness determination that a power source and coupleable cooling unit of USP '483 are encompassed by instant claim 57. Sample claims are pasted below:

Ground 2

Appealed claim

57. A portable induction heating system, comprising in a portable unit:

a power source electrically coupleable to a portable fluid-cooled induction heating cable and operable to provide output power to produce a varying magnetic field;

a programmable controller operable to control induction heating;

a cooling unit fluidically connected to the fluid-cooled induction heating cable to cool the fluid-cooled induction heating cable via a cooling fluid, wherein the cooling unit dissipates heat in the cooling fluid; and

a flow switch coupled to the programmable controller, wherein the flow switch is configured to detect the cooling fluid returning from the fluid-cooled induction heating cable and to effect discontinuation of the output power when the amount of the cooling fluid returning from the fluid-cooled induction heating cable is below a threshold amount.

59. The system as recited in claim 57, wherein the fluid-cooled induction heating cable is connected via connector assemblies to the power source and cooling unit.

ODP USP 6727483

USP 6727483 discloses

12. An induction heating system, comprising:
a power source;
a cooling unit operable to remove heat from a cooling fluid,
a flexible induction heating cable, comprising:
an electrical conductor disposed within a hollow interior of the flexible induction heating cable to produce a magnetic field with electric current provided by the power source;
a first electrical connector electrically coupled to the electrical conductor, the first electrical connector being adapted for locking engagement with a second electrical connector electrically coupled to the power source; and
a first quick-disconnect fluid connector fluidicly coupled to the hollow interior of the flexible induction heating cable.

Appellants in Third Ground argue below:

claim 1 recites "a cooling unit." Independent claim 1 also recites "a *single continuous cooling path* operable to dissipate heat from the fluid-cooled induction heating cable *and* from an electrical lead extending from the portable induction heating system to the fluid-cooled induction heating cable." Appellants respectfully submit that these elements are " not rendered obvious in view of claims 1-28 of the '439 patent. ~~Further, besides a bald~~ " and other claims in Third Ground are noted. But, for one-way obviousness determination that a power source and a programmable power source controller of USP '439 are encompassed by instant claim 1. Sample claims are pasted below:

Appeal claims

1. A portable induction heating system, comprising in a portable unit:

a power source electrically coupleable to a fluid-cooled induction heating cable and operable to produce a varying magnetic field;

a programmable power source controller coupled to the power source for regulating the power conversion; and

a cooling unit fluidically coupleable to the fluid-cooled induction heating cable for providing a cooling fluid through the fluid-cooled induction heating cable and around a workpiece to cool the fluid-cooled induction heating cable, wherein the cooling unit is configured to cooperate with at least the fluid-cooled induction heating cable to provide a single continuous cooling path operable to dissipate heat from the fluid-cooled induction heating cable and from an electrical lead extending from the portable induction heating system to the fluid-cooled induction heating cable.

47. A portable heating system, comprising in a portable unit:

a power source operable to apply output power to an electrical pathway to inductively heat a workpiece, wherein the electrical pathway includes an induction heating cable adjacent the workpiece, a supply path from the portable heating system to the induction heating cable, and a return path from the induction heating cable to the portable heating system;

a power source controller operable to control the heating of a workpiece in response to programming instructions provided by a user to produce a desired temperature profile in the workpiece;

a cart operable to transport the power source and power source controller to the workpiece;

a cooling unit operable to provide a flow of cooling fluid, the cooling unit being disposed on the cart; and

the induction heating cable, wherein the induction heating cable is a fluid-cooled induction heating cable that cooperates with the cooling unit to form at least a portion of a single cooling pathway that is configured to generally extend along the supply path and the return path of the electrical pathway to remove heat therefrom.

51. The system as recited in claim 47, comprising a temperature feedback device operable to produce a signal representative of workpiece temperature to the power source controller.

52. The system as recited in claim 47, wherein the power source controller uses PID control.

53. The system as recited in claim 47, wherein the power source controller uses PI control.

54. The system as recited in claim 47, wherein the system is operable to cause the temperature of a workpiece to a first temperature and lower the temperature of the workpiece from the first temperature to a second temperature at a desired rate.

ODP USP 7015439

1. An induction heating system, comprising:
a power source operable to produce an alternating current to inductively heat a workpiece;
a controller operable to control operation of the power source, wherein the controller is operable to receive programming instructions to selectively increase and decrease workpiece temperature at a desired rate of change and to automatically control operation of the power source to provide inductive heat to the workpiece to selectively increase and decrease the workpiece temperature at the desired rate of change; and
a temperature feedback device operable to provide the controller with an electrical signal representative of the workpiece temperature.

5. The system as recited in claim 1, wherein the controller is operable to control operation of the power source to lower the workpiece temperature at a desired rate of temperature decrease automatically.

6. The system as recited in claim 1, wherein the controller enables a user to establish the desired rate of temperature change by providing a specific desired rate of temperature change.

7. The system as recited in claim 1, wherein the controller enables a user to establish the desired rate of temperature change by providing a desired time period for the workpiece temperature to change and a specific temperature change.

8. The system as recited in claim 1, wherein the controller is operable to control the power source to maintain workpiece temperature at a desired temperature for a desired period of time.

Appellants argue that Henderson fails to disclose “a single cooling pathway”.

First, there is no written description in the specification as originally filed to define the

structure of "a single continuous cooling path". In view of instant Figure 4, elements fluid control unit (74), cooling fluid (104), and output block (106) are merely read on circulate cooling fluid (see Figure 4 below).

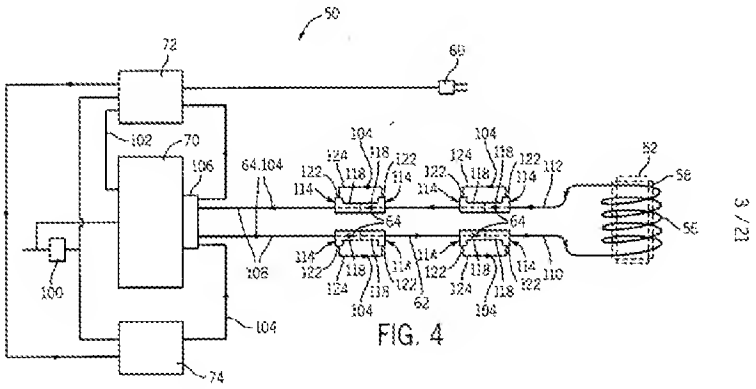
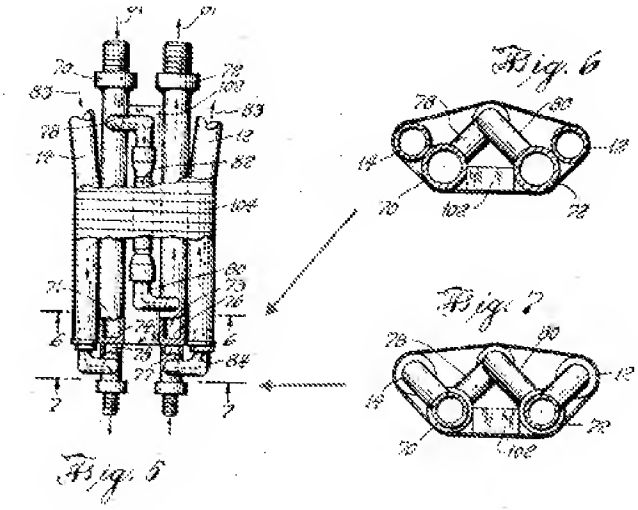


FIG. 4

Second, appellants referred to Figure 5 of Henderson to support their position that Henderson discloses two separate cooling paths (see remarks in pages 18-20). Henderson Figure 5 discloses cooling water conduits 12 and 14 and water-cooled



electrical conduits 16 and 18.

In col. 3, lines 38-45, Henderson discloses

Referring to FIGS. 5, 6, and 7, to form a handle for the operator to manipulate the heating element **22** the tubular elements **70** and **72** with their inter-connection **78**, **82** and **80** and the ends of water conduit leads **12** and **14** are mounted on a spacer **102** of electrical insulation material and bound thereto by a wrapping **104** of insulation tape, the tape being shown broken away in FIG. 5 to show details of the several elements.

67, and 69-78. For instance, independent claim 57 (which is believed to be representative of this subset of claims for purposes of the present ground of rejection) recites "a flow switch ... configured to detect the cooling fluid *returning from the fluid-cooled induction heating cable* and to effect *discontinuation of* the output power when the amount of the cooling fluid returning from the fluid cooled induction heating cable *is below a threshold amount*" (emphasis added). Because the cited references fail to disclose such elements, the cited references fail to establish a *prima facie* case of obviousness with respect to these claims, and the present rejection thereof is in error.

Appellants argue that " " But, use a flow switch to turn off power because of low amount of coolant is taught by Somes in

... adequately cool the same.
By providing an energizing circuit for the coil under the control of the flow switches described, I have provided insurance that the heating and quench heads are in proper position and that the inducing coil will be adequately cooled, with the further insurance that should the heads not be registered or that the coil is not properly cooled, the inducing coil cannot be energized or will be immediately deenergized if one or both said conditions arise during a heat treating operation.
This is most particularly advantageous in automatic heating and quenching apparatus under the control of an automatic timer control mechanism such as that described in my copending application aforesaid, because unless the conditions described herein were proper for the heat treating operation, the flow switches will prevent the timer control mechanism from energizing the inducing coil.

page 3,

Instant specification as originally filed does not disclose/define the structure or function of recited flow switch which is different from conventional flow switch. Therefore, the recited "flow switch" is mere conventional and perform functions as a conventional "flow switch".

Appellants argue that " There is no disclosure, suggestion, or even hint in the cited reference that the solenoid 122 or control box 131 somehow "detect cooling fluid," as recited in the present claims. ~~In fact, as described in the cited reference, one skilled in the art would understand~~ "

57. (currently amended) A portable induction heating system, comprising in a portable unit:

a flow switch coupled to the programmable controller, wherein the flow switch is configured to detect the cooling fluid returning from the fluid-cooled induction heating cable and to effect ~~a change in~~ discontinuation of the output power when the amount of the cooling fluid returning from the fluid-cooled induction heating cable is below a threshold amount.

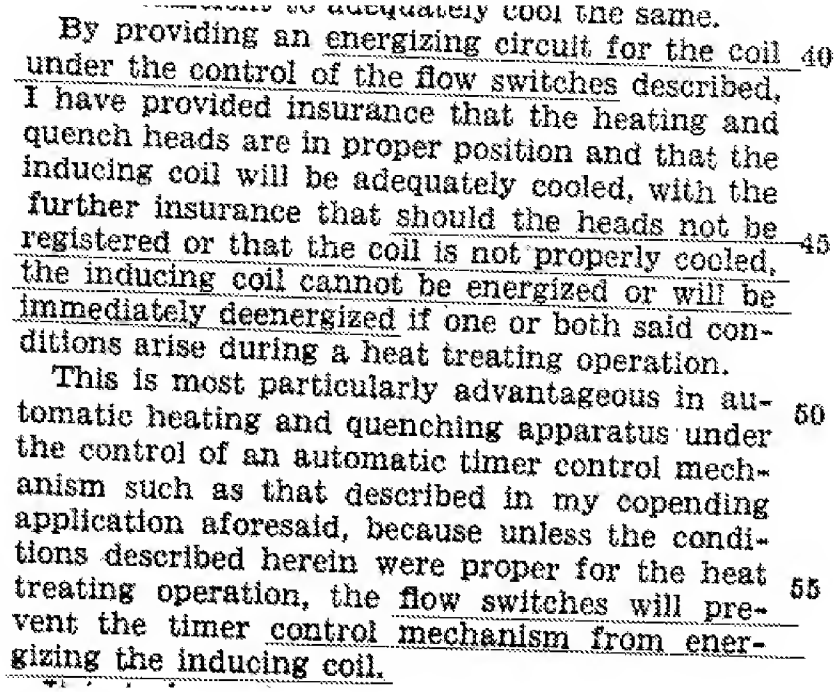
But, , the recited "flow switch" turns off output power when coolant fluid is low which function similar to teaching of Henderson as recognized by appellants in instant remarks (pasted below).

Id. In other words, the solenoid 122, via the control box 131, simply opens the valve 120 when power is applied to the heating element 22, and closes the valve 120 when power is not being applied to the heating element 22. Valve (120 turns power to heating element (22) off if no (low) coolant is circulating. Valve (120 turns power to heating element (22) on if detectable coolant is circulating. See col. 3 below:

The solenoid **122** is connected by line **129** and control box **131** to a control cable **130** shown in FIG. 4 which in turn is connected to the power supply motor-generator set (not shown) to actuate the valve **120** through solenoid **122** to open position and supply cooling water to the induction heating element **22** only when power is being delivered to the heating element. ~~The check valve **128**~~

But, "valve" or "flow switch" in Henderson and Somes, respectively, functions to turn power of induction heating element on/off by responding to coolant according to design/program which read on claimed limitation.

Appellants' argument in paragraph bridging pages 24-25 of instant brief is noted. But, flow switch of Somes operates same as instant claimed that turns power off when low cooling water is detected. Somes col. 3, lines 40-58, below:



...adequately cool the same.

By providing an energizing circuit for the coil under the control of the flow switches described, I have provided insurance that the heating and quench heads are in proper position and that the inducing coil will be adequately cooled, with the further insurance that should the heads not be registered or that the coil is not properly cooled, the inducing coil cannot be energized or will be immediately deenergized if one or both said conditions arise during a heat treating operation.

This is most particularly advantageous in automatic heating and quenching apparatus under the control of an automatic timer control mechanism such as that described in my copending application aforesaid, because unless the conditions described herein were proper for the heat treating operation, the flow switches will prevent the timer control mechanism from energizing the inducing coil.

Appellants' argument in "Ground of Rejection No. 6" is noted. Examiner reiterates the same responses set forth above for the same arguments.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Sikyin Ip/

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